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SCIENCE NEWS LETTER

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MEDICINE

Two Kinds of Jaundice

One virus, called IH, causes infectious hepatitis and the other virus, SH, causes homologous serum hepatitis. Each is contracted in a different way.

➤ A MYSTERY about yellow jaundice, skin-coloring and liver-attacking disease of fighting men and children alike, has been solved by the discovery that there are actually two kinds of the disease.

Two kinds of virus, one IH (infectious hepatitis) and the other SH (homologous serum hepatitis), were announced and described to the International Congress on Tropical Medicine and Malaria meeting in Washington by Dr. John R. Neefee of the University of Pennsylvania Medical School.

Jaundice worried the Army greatly during the early days of the war when it attacked large numbers of our troops who had been vaccinated against yellow fever. The worst worry, that the men had gotten yellow fever from the vaccine, was soon relieved. It was not yellow fever and the stuff in the vaccine that gave them the jaundice was eliminated from further batches of vaccine.

But jaundice continued to take a serious toll among the armed services of many nations during the war. It broke out in a summer camp for boys and girls in Pennsylvania after the war. It had plagued civilian populations for years. The puzzles of what it was and how you got it and how to stop it continued.

The jaundice itself, which is the yellow color of skin and eye whites, is only a symptom. The underlying condition is a liver inflammation, called hepatitis.

With the discovery that there are two viruses, each causing a different kind of jaundice, the puzzles are partly solved. One virus, called IH, causes infectious hepatitis. This jaundice sickness starts within 15 to 37 days after the virus gets into the body. It develops suddenly, with fever and other sharp clinical signs before laboratory tests show the presence of the infection.

The other virus is called SH. The jaundice it causes is named homologous serum hepatitis. This disease does not develop until 60 to 135 days after the virus has gotten into the body. And when it does develop, it comes on slowly, without fever, and laboratory signs come before the symptoms of the disease.

Both viruses cause hepatitis when injected into the body. But only virus IH causes disease when it gets into the body by the mouth, being swallowed in food or water. Immune serum protected against virus IH but not against virus SH, Dr. Neefee found from his studies with human volunteers. Getting IH hepatitis, however, does not protect against an attack of SH hepatitis, nor does an attack of SH protect against IH.

Once started, an attack of IH hepatitis is much like one of SH. This had led doctors to think they were dealing with just one disease. But it was hard to see how a disease that could break out in an epidemic in a children's camp could also attack a grown-up thousands of miles away who had never had any contact with any jaundice patient. The answer, Dr. Neefee's studies show, is that the children had one kind of hepatitis, and the grown-up had a different kind caused by a different virus and contracted in a different way.

The IH disease apparently can be spread like typhoid fever, from food, milk, water or other things sometimes put in the mouth such as pencils, if they are contaminated with the virus.

Since both viruses get into the blood of the patient, they might be spread by biting insects. No evidence that they are, however, has yet been discovered.

Dr. Neefee cautioned against the dangers of transmitting both these diseases in injections involving transfer of blood or its products from person to person. He pointed out also the risk of using improperly sterilized needles or syringes as a source of infection. Hepatitis viruses have survived heating to 56 degrees Centigrade (138 degrees Fahrenheit) for periods of 30 to 60 minutes.

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PUBLIC HEALTH

Battle Alcoholic Problem

➤ A "HANDS across the continent venture" for battling the problems of alcohol will get started this summer when the Yale Institute of Alcohol Studies in the Southwest is established.

The joint attack by Connecticut and Texas educational and scientific leaders was formally inaugurated at a two-day celebration at Fort Worth, Texas, May 14 and 15.

Plans for the establishment by Yale University of a large, long-range research and clinical center in cooperation with Texas Christian University were announced by Dr. Howard W. Haggard, director of the Yale Laboratory of Applied Physiology.

As now planned, the Yale Institute of Alcohol Studies in the Southwest will comprise the following activities:

1. A research unit in the social sciences at Texas Christian University.

2. A clinic for the rehabilitation of alcoholics at Dallas.

3. A summer School of Alcohol Studies at Trinity University, San Antonio. This will be patterned after the nationally famous summer school conducted each year in New Haven by Yale.

4. Informal educational activities, at all levels, throughout the state.

The clinic in Dallas, Texas, under the direction of a psychiatrist who has specialized in the treatment of alcoholism, will conduct research on physiological sensitivity to alcohol, psychological factors contributing to alcoholism, preventive mental hygiene and tests of new methods of treatments. All work will be carried out in cooperation with medical institutions which will receive grants from the Yale Institute.

The clinic will maintain in-patient and out-patient services, will accept referrals from all sources and will offer its services particularly to the police courts in order to replace admittedly useless penal methods by clinical treatment. It will seek to use all community resources in the care and treatment of alcoholics. One of its most important functions will be the training of clinical personnel to meet the great demand for specialists.

The research unit in the social sciences will consider: methods of alcohol education in schools; investigation of social, economic, educational and religious factors which may be used in the prevention of inebriety; determination of the extent and intensity and nature of alcoholism in Texas and the Southwest in various age groups, occupations, rural and urban areas; a survey of the effectiveness of liquor control laws.

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ARCHAEOLOGY

Double Double-Cross

This modernly flavored bit of political connivance took place some 2500 years ago in Greece. The word "ostracism" comes from the peculiar ballots used.

➤ HERE is the story of a political double double-cross, that happened in a certain town. After you have read it, you may figure out whether it might possibly have been your town.

Three men were contending for recognition as top boss. Let us identify them, for the moment, by nicknames. First there was "Bolo," considered pretty much a left-winger; a man of working-class origin, strong for the labor vote. Opposing him was "Al," an ambitious, up-and-coming young fellow, but rated as reasonably safe by the solid-businessman element. Between them was a veteran officer, "Nicky," expected to catch a considerable ex-GI vote.

An election was coming up, in which all three would figure. The deal was that the one who came out at the bottom of the heap would have to leave town and stay away for ten years.

Al first turned his guns on Nicky. That looked like a signal for Nicky and Bolo to gang up against him. Realizing this in time, and not relishing the idea of having to spend his best ten years out of politics, Al switched, supported Nicky whom he had at first attacked, and so sent Bolo into exile.

All this happened in Athens. Not Athens, Ga., or Athens, Ohio, but Athens, Greece. And for all the modern flavor of the skullduggery it happened nearly 2500 years ago, in 417 B.C., when Hyperbolos the demagog got the short end of an ostracism election in which the other "candidates" were Nikias, a popular general, and Alcibiades, about the smoothest politician that Greece ever produced.

The story is told in the journal, *Archaeology* (Summer, 1948), by Antony E. Raubitschek, along with some interesting tales of other ostracisms conducted in ancient Athens.

That interesting political device, by which the citizens could pick out one of their number and exile him for ten years, seems to have been the one real chance that they have ever had to indulge the very human impulse to "vote against" someone, without having to vote in favor of someone else whom they didn't like, either. You simply put on your ballot the name against which you had the biggest gripe, and if enough of your neighbors did the same thing, out he went.

The ten-year sentence of exile was softened by the possibility of a recall by vote of the Athenian Assembly, or town council. And whether he served out his full ten years or was recalled sooner, the loser retained his citizenship and title to his property. Some of Athens' most noted leaders suffered ostracism, and were subsequently recalled to lead the state anew.

Ostracism gets its name from the peculiar ballots used. Voters scratched the names of the "candidate" on bits of broken pottery, which were known as "ostraka." Originally, ostraka were oyster-shells, and the name apparently was transferred to the pottery scraps because of a general resemblance in size and texture.

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AN OSTRAKON—Sometimes called a potsherd ballot, it was used in the voting that sent into exile one of Athens' foremost citizens. It bears his name, in crudely scratched characters: Aristeides, son of Lysimachos. This could be the very ballot which one grouchy Greek cast because, he said, he was "tired of hearing Aristeides called 'the Just'."

MEDICINE

Hibernation of Germs Affects Malaria Relapses

➤ HIBERNATION plays a part in the time interval between relapses of malaria, Drs. G. Robert Coatney and W. Clark Cooper of the National Institute of Health told the Congress on Tropical Medicine and Malaria meeting in Washington.

The hibernating is done by the malaria germs, or parasites as doctors call them. This hibernation seems to be the reason why there is a long, over-winter period between a first attack of malaria and the first relapse in patients who get malaria in the United States. It may also be the reason for the spring wave of malaria in other temperate-zone regions.

Malaria germs from the tropics, however, such as attacked our fighting forces in the South Pacific, do not seem to hibernate. Relapses come in close succession, as many a veteran knows.

Drs. Coatney and Cooper had a unique chance to compare malaria parasites in the course of the war search for a quinine substitute for malaria treatment. Human volunteers were used in one stage of the studies. By 1944 the doctors had germs of vivax malaria from the blood of a soldier recently returned from New Guinea. They belonged to the Chesson strain of malaria germs. The doctors were able to infect some human volunteers with these germs and infect other

volunteers, living side by side under identical conditions, with germs of the St. Elizabeth vivax malaria strain. These were isolated in the United States.

The St. Elizabeth strain caused a first attack within a few weeks after the volunteers were bitten by infected mosquitoes. But the relapse did not come until six to 12 months later. The Chesson strain caused relapses one right after the other.

The doctors do not think the Chesson strain will adapt to our temperate-zone climate and abandon its tropical habit of developing rapidly in the body.

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MEDICINE

High Blood Pressure Aids

Adding salt to the food and injecting an anti-blood clotting chemical in patients with this kind of disease appears to bring improvement.

➤ MORE salt in the diet and an anti-blood clotting chemical are two new weapons for fighting high blood pressure. They were discussed at the meeting of the American Foundation for High Blood Pressure in Cleveland.

More salt in their food is the pleasant prospect for patients with the kind of high blood pressure doctors call malignant hypertension and kidney disease. The present trend of restricting salt rigidly in such cases has gone too far, in the opinion of Dr. Francis D. Murphy of Marquette University School of Medicine. He reported that many patients are doing better when salt is added to their food, rather than restricted.

The anti-clotting chemical, heparin, is being tried cautiously in women who develop high blood pressure during pregnancy. This is the forerunner of dangerous convulsions. The ancient Greeks seeing a pregnant woman seized with a sudden fit thought it was due to a lightning thrust from heaven and gave it the name of eclampsia, meaning, "a bolt from the blue."

The condition remains a mystery, although modern doctors can detect the early stage of the disease by watching the pregnant woman's blood pressure. When it goes up, the patient is usually promptly put to bed. What to do next has remained a problem because the cause of the condition is not known.

It is known, however, that the blood of women with this condition clots more quickly. The red blood cells tend to stick together and the small blood spaces in the liver and placenta seem to be blocked by clotting fibers.

This has led to the trial of the anti-clotting chemical, heparin. When this is injected for several days into the veins of women in the pre-eclampsia stage, many of the serious symptoms seem to improve, Dr. E. W. Page of the University of California Medical School reported.

The improvement lasts as long as the drug is given. But the drug seldom cures the condition completely for the blood pressure often remains high.

The new treatment, Dr. Page pointed out, has certain drawbacks. It is expensive. The patient requires constant attention day and night. And it is dangerous, although no harmful effects have been noted so far.

Dr. Page and other scientists consider it merely a step toward development of a simpler, less costly treatment which will produce the same good results.

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PSYCHOLOGY

Color of Skin Doesn't Affect Color Vision

➤ THE color of a person's skin has nothing to do with the acuteness of his color vision, it is indicated by a study made by Dr. R. W. Pickford, of the psychology department of the University at Glasgow, Scotland. His race may have.

Tests on 571 men and women normally sensitive to color and 138 colorblind persons, reported in the scientific journal, *Nature* (May 1), show that red and green are mixed up by dark people just as much as by the fair but no more often.

These results are in conflict with the earlier finding that red-green blindness is more common in the south and west of the British Isles where the original dark-skinned inhabitants were pushed back in the days when the blond Nordics invaded. Earlier studies had also shown that red-green blindness is less common among American Indians and American Negroes than among American whites.

It may be racial difference rather than the difference in color that is related to differences in color vision, Dr. Pickford suggests.

To check on this, he tested 20 members of dark-skinned races. Still he found no difference in ability to see and distinguish red and green. They are, however, less sensitive to blue and yellow.

Nine of the group are Dravidians, a people from India. These people were found to be less sensitive to yellow and blue than the Europeans tested. Six West Africans were even less sensitive than the Dravidians.

Negroes and American Indians, it seems, have better red-green color vision than Europeans, but Dravidians and Negroes are more often weak in vision of yellow and blue.

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ASTRONOMY-RADIO

Moon Affects Reception

Shortly after a new or full moon the band of frequencies usable for shortwave radio broadcasts is narrowed slightly in some parts of the world.

➤ NOT just the sun, but also the moon affects reception of shortwave radio broadcasts.

Three or four days after the moon is new or full, the band of frequencies that can be used to get shortwave broadcasts through to distant stations is slightly narrower in some parts of the world than at other times.

At Huancayo, Peru, where the effect is quite pronounced, the usable frequencies at noon from November to February averaged 1.7 megacycles lower three or four days after new and full moons than after the quarters of the moon. This was reported by Dr. A. G. McNish of the National Bureau of Standards at the joint meeting in Washington of the International Scientific Radio Union, American Section, and Institute of Radio Engineers.

Just as the moon raises tides in the ocean, so it produces tides in the atmosphere. That portion of the earth's atmosphere facing the moon is actually pulled toward the moon, and the earth in turn is pulled away from the atmosphere on the opposite side. Thus the atmosphere bulges out at these two regions.

This football effect also works on the ionosphere, series of invisible layers 50 to 250 miles above sea level that bounces radio waves back to the earth and enables us to hear distant broadcasts. But this direct tidal effect alone does not adequately explain the low critical frequencies, Dr. McNish pointed out. Such an explanation has been advanced by D. F. Martyn of Australia who last year independently reported that critical frequencies vary with the phases of the moon.

As an alternate explanation Dr. McNish and T. N. Gautier, also of the National Bureau of Standards, suggest that the variations are due to magnetic fields which are known to be set up within the atmosphere by the lunar variations.

Solar radiation ionizes the atmosphere on the sunlit side of the earth by knocking electrons out of atoms. Currents can flow in this ionized atmosphere. The magnetic field of these currents modifies slightly the earth's magnetic field. These resulting currents are further modified by the tidal action of the moon.

These currents affect the ionized layer of the earth, and tend to decrease its density. When the ionization is reduced, the highest frequency that can be used to get broadcasts through to distant countries is lowered. This critical frequency has been found to be a megacycle or two lower than it would be were the near-by moon not affecting the ionized layers.

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ASTRONOMY-RADIO

Radio Signals Go Farther

➤ SHORTWAVE radio broadcasts go much farther with only one reflection from the earth's radio roof when the sun's disk is marred with many sunspots than during sunspot minimum.

This is because the reflecting layer is much higher during sunspot maximum, R. C. Peavey of the National Bureau of Standards stated at the joint meeting of the International Scientific Radio Union, American Section, and the Institute of Radio Engineers in Washington.

The point of reflection is higher throughout the entire day, Mr. Peavey and Miss Gladys R. White, also of the Bureau, have found. From the middle of the afternoon through the evening, it is as much as 125 miles higher than during sunspot minimum.

In the past it has been assumed that radio signals during a single hop go a maximum distance of 2,500 miles. But when there is much activity on the sun, a single-hop transmission may be 800 miles more than this. Signals being reflected only once have been estimated to travel as far as 3,300 miles.

The whole radio roof, layer of ionized particles that return radio signals to the earth, is much thicker during sunspot maximum, Mr. Peavey reported. The thickest part of the ionized layer moves farther from the earth without an appreciable increase in the height of the bottom of the layer.

This mattress of atoms with the electrons knocked out of them is twice as thick in the early morning during sunspot maximum as during periods of little activity on the sun. It becomes three times as thick during the middle of the day.

At sunspot maximum the highest frequency which is reflected from the radio roof at any instant when the signals are sent directly skyward is much higher than at other times. It has always been expected, Mr. Peavey said, that the highest usable frequency would increase along with an increase in critical frequency. While this is true a big proportion of the time, there are outstanding exceptions.

At certain hours for certain locations the maximum usable frequency will not be appreciably greater than at sunspot minimum. The point at which the signal is reflected largely determines just when these exceptions will occur.

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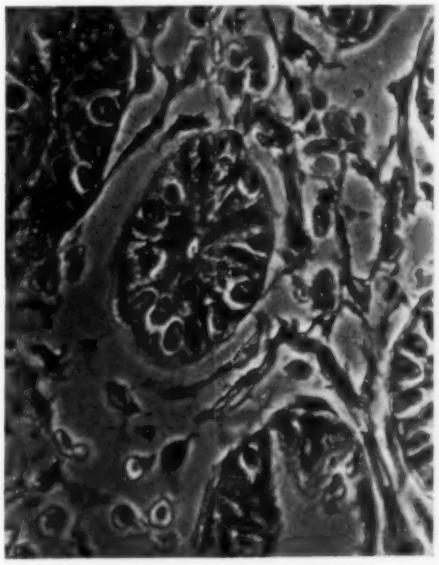

***DELICATE CELL STRUCTURE—** Details of liver tissue photographed in a fresh unstained condition are revealed by the phase microscope. (See SNL, May 8). They are invisible under the ordinary microscope. This instrument is expected to reveal much about important life processes. The picture was taken at the Carnegie Institution Department of Johns Hopkins Medical School.*

MEDICINE

One Out of Three Saved

➤ ONE person in three who would be expected to die from a specific heart attack can be saved by intelligent use of two new drugs, Dr. Irving S. Wright of New York declared at the meeting of the Illinois State Medical Society in Chicago.

The one out of three to be saved would be a victim of a blocking of the artery supplying the heart muscle with blood. Coronary occlusion is the medical name for the condition. When the blocking is caused by a blood clot, doctors call it coronary thrombosis.

The drugs that would save him are anti-clotting chemicals. They are called heparin and dicumarol. Heparin is extracted from the liver. Dicumarol is found in spoiled sweet clover but is also made synthetically.

These drugs were used in a study of 1,000 patients at 17 hospitals throughout the United States. The study was set up in 1946 under the auspices of the American Heart Association and financed by the U. S. Public Health Service.

"During the past 20 months patients admitted to the participating cardiac (heart) services on even days of the months have received conventional treatment while those admitted on odd days of the months have received conventional plus anticoagulant (anti-clotting) treatment," Dr. Wright explained.

The results to date show that the number of deaths from coronary thrombosis can be reduced from approximately 23% to 13%, or between one-third and one-half. The number of thromboembolic complications can be reduced from approximately 19% to 9%, or one-half, by the proper use of anticoagulant treatment, Dr. Wright reported.

Patients with rheumatic heart disease who suffer multiple attacks of blood vessel blocking by blood clots are likely also to be helped by the anti-clotting drugs. Twenty-two such patients have been given the new treatment since 1946.

Some who have had as many as 12 and even 20 blood clots have stopped having them, Dr. Wright reported. In the six treated more than one year, one for as long as 19 months, no blood clots have developed.

The new method has some disadvantages, Dr. Wright pointed out. It is difficult to keep patients faithful to the treatment regime over long periods when they are not in the hospital. And the drugs themselves are not ideal. Most of the so-called failures with them, however, come from failure to give enough of the drugs, he said.

The possibility of using these or a still-to-be-discovered ideal anti-clotting drug as a preventive of some forms of heart trouble was discussed by Dr. Wright.

"The fact that an extremely high percentage of persons in the older age group die or are crippled by thrombotic episodes raises interesting questions regarding the widespread prophylactic use of such a drug, first suggested by E. V. Allen," he concluded.

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MEDICINE

Give Pint of Blood Yearly

➤ EVEN in peacetime America must give 3,700,000 pints of blood each year, Admiral Ross T. McIntire, administrator of the American Red Cross National Blood Program, told members of the pharmaceutical profession meeting in Washington.

An offer to help achieve this goal was made by the American Pharmaceutical Association during ceremonies dedicating a war memorial to pharmacists.

The 3,700,000 pint figure is the blood physicians and surgeons estimate the nation needs each year to save the lives of accident victims, mothers in childbirth, sufferers from hemorrhage due to other causes and sick people who can be helped to recovery through use of various components of blood. More than 50 such components have been discovered and many of them are medically useful, Admiral McIntire said.

To meet the blood needs, at least one out of every 20 persons between the ages of 21 and 59 must give a pint a year. The first six of an eventual nationwide network of Red Cross blood centers for collecting and distributing blood have already been established. The blood collected through this program and its products will be supplied without charge where needed.

"Preparedness," or "civilian defense planning" may constitute a "moral equivalent of war," Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, declared at the health conference on national security held in conjunction with the war memorial dedication.

What such planning or preparedness amounts to, he said, is "building a strong peacetime public health program through the cooperation and team work of all groups concerned with health.

"It is our best guarantee of national happiness and prosperity."

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GENERAL SCIENCE

Memorial Fund Established For Students of Science

➤ A MEMORIAL fund, the income of which will be used to "reward and help young students of science," is being established at Princeton University in memory of the late Shuichi Kusaka, internationally known Japanese-born physicist and a member of the Princeton Faculty, who was drowned last August at Beach Haven, N. J., it was announced by Dr. Harold Willis Dodds, president of Princeton.

Several distinguished scientists including Dr. Albert Einstein, Dr. J. Robert Oppenheimer, director of the Institute for Advanced Study, and Prof. Henry D. Smyth, chairman of Princeton's Department of Physics, are among the members of the committee sponsoring the project that has already gained the support of Japanese-Canadians in Vancouver, British Columbia, where Dr. Kusaka made his home before World War II.

Born in Osaka, Japan, Dr. Kusaka moved to British Columbia when he was five years old and was graduated from the University of British Columbia in 1937 with highest honors in mathematics and physics. He took his Master in Science at the Massachusetts Institute of Technology in 1938 and in 1942 was granted his doctorate in theoretical physics by the University of California.

He became a member of the Institute for Advanced Study in 1942. A year later he joined the Smith College faculty and, following two years of enlisted service with the Army of the United States at the Research Laboratory at the Aberdeen Proving Ground, Md., became a member of Princeton's Department of Physics. Shortly before his death last summer he was promoted to an assistant professorship at age 31.

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MEDICINE

Hormones Check Aging?

What may be an anti-aging effect on the body, an increase in the size and weight of vital organs, was noted after giving various combinations of hormones.

➤ THE mythical fountain of youth is to be found, if at all, in properly balanced doses of all the main hormones produced by the body's glands.

This suggestion comes from the latest report of a scientific search for an anti-old age chemical or combination of them. The search is being carried on by Dr. V. Korenchevsky of the Gerontological Research Unit at Oxford University.

"Some processes of aging can be influenced arbitrarily," he reports to the *British Medical Journal* (April 17).

But it is only some processes which his studies thus far show can be influenced, he stresses.

Male and female sex hormones and thyroid hormone were tested for their effects on aging in female rats. The rats were artificially aged, or made into old lady rats, by having their ovaries removed. The hormones were given alone and in various combinations. The effects were determined by comparing the size and structure of vital organs, such as the adrenal glands, liver, thyroid gland, kidneys, spleen and heart, in the treated animals with the same organs in normal animals and in artificially aged animals that were not treated.

All the hormones had a stimulating and in some cases a simultaneously depressing effect on various organs.

The stimulating effect was shown by an increase in size and weight of the organs. Dr. Korenchevsky thinks this is a sign of an anti-aging effect because decrease in size and weight should be the first sign, at least in some organs, of the shrivelling they do in growing old.

The organs of the artificially-made old lady rats came nearest to the size and structure of the normal young lady rats when all four hormones (male, two female and thyroid) were given simultaneously in suitable, not excessive, doses.

"In this way," Dr. Korenchevsky reports, "a cooperation of useful effects and more or less complete neutralization of pathologic (injurious) effects occurred."

Harmful effects on some organs did occur when large doses of one or another of the hormones were given.

The results, Dr. Korenchevsky points out, do not warrant any definite conclusion as to whether the increase in size of the organs is, as it appears to be, a favorable check to the process of aging. The increased size may, instead, be a kind of artificially produced deformity.

Before any factor can be considered as an anti-aging one, he stresses, especially for treatment of old or aging people, more must be investigated than the changes in weight and size of some organs. For this purpose, both experimentally and clinically, many studies of the biochemical, physiologic and structural changes must be made.

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PSYCHOLOGY

Trance Slows Down Time

➤ TIME can be slowed so that incredible tasks can be accomplished in the mind—in the course of only a few seconds.

This is done by suggestion during a hypnotic trance, Dr. Linn F. Cooper, Georgetown University physician, reports in the Bulletin of the University's Medical Center.

The slowing of time's flight was accomplished by Dr. Cooper through use of a metronome beating out a regular tick-tock, tick-tock, at one beat a second. The young lady whom he had previously hypnotized was told the rate. Then she was told that he was gradually slowing down the rhythm until only one tick sounded each minute.

In her trance, she seemed to accept this new notion of time.

Then, Dr. Cooper told her that at a signal she would visit in her "mind's eye" her school when she was in the fifth grade. She would have ten minutes and then would be told to stop.

After ten beats of the metronome—ten seconds—the girl was awakened and asked to tell what had happened.

She said she had had "lots of time," told who she had met and talked with, told of walking down a hall, and described the appearance of the school and her classmates. When she learned that all this had transpired in her mind in ten seconds, not ten minutes, she was amazed.

The same speeding up of activity took place when she was not stopped but allowed to continue until she finished a task but told she must finish within a set time. Once it was suggested to her that she was in a cotton patch near her home. She was to walk along the rows and pick and count the cotton bolls. She counted for what she thought was 80 minutes. She told of doing it carefully, looking under the leaves so that she would not miss any. There were 862 bolls, she said.

Actually it had taken her just 3 seconds. For a waking person it is just not possible to count 862 of anything—even in the imagination—in only three seconds.

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"ELECTRICAL YARDSTICK"—It is used for measuring the high voltages required in many scientific experiments. A scientist is shown in the picture adjusting the control instruments as an arc, generated by 90,000 volts of electricity, leaps across the gap between the two spheres of the "yardstick," which is held upright by the frame in the foreground. The distance between the spheres can be used as an accurate measure of the voltage. This research tool is being used by Westinghouse Research Laboratories.

GENERAL SCIENCE

Science Foundation Bill Passes Senate Third Time

➤ A BILL to establish a National Science Foundation has been passed by voice vote in the Senate.

It was the third time over the Senate hurdle for the Foundation which leaders in science, government and industry have been urging since the end of the war.

Two years ago the Senate first passed a bill to create the Foundation, but the legislation died in the House. Last year, both houses passed a Science Foundation measure which President Truman vetoed. The new bill, which now goes to the House, is believed to meet the major objections raised in the President's veto message.

Some scientific and educational groups are already making up lists of names to help the President in appointing the 24 members of the Foundation. In addition to this group, the President, under the new bill, appoints a director for the Foundation. Appointment of the director by the members of the Foundation was provided for in the bill which was vetoed.

The measure would create a civilian, peacetime organization for promoting government support of science. It was proposed originally as a postwar successor to the highly successful Office of Scientific Research and Development which mobilized scientific effort in World War II.

But OSRD has gone out of business and its functions have been scattered, while legislation for the Science Foundation has bogged down. Now, it is hoped, the long-awaited Foundation may at last be approaching formation.

Science News Letter, May 15, 1948

GENERAL SCIENCE

Academy Issues Statement Criticizing Condon Attack

➤ THE National Academy of Sciences, the "senate" of American science, has approved by a large majority a statement that the treatment of Dr. E. U. Condon, Bureau of Standards director, by the House Un-American Activities Comittee "may have the effect of deterring scientists from entering government employ and may diminish the respect with which citizens regard opportunities for service to their government."

The statement approved in a mail poll prior to the annual meeting held recently also objected to the Thomas committee calling Dr. Condon a menace to national security without having given him a hearing.

Dr. A. N. Richards, president of the Academy, revealed that he had reported to the academicians that Rep. J. Parnell Thomas (R., N. J.) had authorized him to assure the Academy that "Dr. Condon would be treated with complete fairness" in the hearing which subsequently was indefinitely postponed. The Academy is reported to have voted "intense and continuing interest in the conduct and outcome of the forthcoming hearings."

Science News Letter, May 15, 1948

MEDICINE

Three Deaths Traced To Contaminated Solution

➤ AT least three deaths and 10 injuries attributed to an unknown substance contaminating a sugar and salt solution given to critically ill patients have been reported to the U. S. Food and Drug Administration. The reports were from Kentucky, Georgia, Florida and Alabama.

The solution is known technically as five percent glucose in normal saline. Such solutions, given by injection into the vein, are used almost routinely for patients just after surgical operations as well as in other conditions. The contamination occurred in the solution manufactured and distributed by Cutter Laboratories of Berkeley, Calif. Doctors and hospitals have been warned not to use bottles of this solution bearing the code number CM 8164, and to notify the Food and Drug Administration immediately if they have any in their possession.

All Food and Drug Administration laboratories have been put to work on the problem of identifying the contaminating substance, while field officials are making a nationwide survey to track down the several hundred bottles of the original shipment which have not yet been recovered.

Vomiting, diarrhea, cyanosis (blue skin color) and very low blood pressure are the symptoms reported after use of the contaminated solution.

Food and Drug Administration action started when the American Medical Association notified them that a Kentucky physician had reported injury to a patient following use of the Cutter glucose solution.

Science News Letter, May 15, 1948

IN SCIEN

PLANT PHYSIOLOGY

Plants Need Some Zinc To Promote Proper Growth

➤ ZINC is needed in microscopic quantities by plants to promote normal growth. This role of the metal in plant nutrition has been proved by researches conducted in the botany laboratories of the University of Wisconsin by Dr. Cheng Tsui.

Tomato plants grown in a culture solution without the slightest trace of zinc grew a few inches, then stopped. When a little zinc was added, they resumed growth and eventually became almost normal.

Zinc-deficient plants were found upon analysis to be very short of the natural growth-promoting substance known as auxin, and also to be short in the protein building-block, tryptophane, from which auxin is formed in the plant. The direct effect of zinc lack appears to be in blocking the synthesis of tryptophane.

Details of the experiments are reported in the *American Journal of Botany* (March).

Science News Letter, May 15, 1948

DENTISTRY

Dentist Population Has Increased by 8,000

➤ YOU have a better chance of seeing a dentist if you live in the middle east and central states than if you live in Southeast or Southwest, the latest roll call of the nation's dentists shows. The roll was called by the American Dental Association for its new directory of dentists.

The nation has 8,000 more dentists now than the 1940 census showed. Total number today is 78,490.

Greatest number of dentists in proportion to population are found in New York State. The figure there is one dentist for each 1,106 residents. Next highest is Washington, D. C., with one dentist for each 1,197 residents. Other states well supplied with dentists are: Minnesota, Illinois, Wisconsin, Nebraska, Connecticut and California.

States with fewest dentists in proportion to population include: Mississippi, South Carolina, Arkansas, Alabama and Georgia.

Science News Letter, May 15, 1948

NE FIELDS

BACTERIOLOGY

Revived Dead Germs Give Clue to Drug Resistance

➤ CLUE to the drug resistance which makes penicillin and streptomycin fail to cure some patients may come from dead bacteria which have been revived.

The revival of these germs, which had been dead to every known test for as long as three days, was accomplished by Prof. George I. Wallace and Miss Ione Rhymer of the University of Illinois.

The bacteria, or germs, had been killed by streptomycin. Reproduction through cell division, common evidence of bacterial life, was halted completely. Some of the germs had even twisted into weird shapes under the influence of the drug. They appeared completely inert. But when a mysterious "inhibiting factor" was added to them, they resumed normal activity and appearance.

The "inhibiting factor" was obtained from the media on which the bacteria had been growing before streptomycin was added. The Illinois bacteriologists found three years ago that bacteria growing in certain media were killed more readily by streptomycin than the same kinds of germs growing on different media.

The chemical nature of the "inhibiting factor" is now being studied by Prof. Herbert E. Carter of the University's chemical department. It may be lipositol, a protein substance customarily obtained from brain tissue or soybeans, or an ingredient of this protein.

Effects of the factor on bacteria and the possibility that bacteria themselves may produce it are also being investigated.

Science News Letter, May 15, 1948

PHOTOGRAPHY

Fastest Camera Shutter Known to Science Revealed

➤ THE fastest camera shutter known to science, capable of operating at a rate of 100,000,000 frames per second, was revealed at the Navy's dedication of the new Michelson Laboratory at the Naval Ordnance Test Station, Inyokern, Calif. It is in the Zarem camera, invented by Dr. A. M. Zarem.

The Zarem camera is about 25,000 times faster than the fastest motion picture camera commercially available. If motion pictures of a bullet leaving the muzzle of a gun were taken at this rate of 100,000,000 frames a second and projected on a screen at the normal rate, the bullet would appear to travel about four feet an hour.

A so-called Kerr cell is the secret of this fast shutter. This cell, long used by scientists, is a glass tube filled with nitrobenzene in which a pair of electrodes is immersed. The Kerr cell is placed between two polarizing plates so set that the polarized light emitted through the first is in the wrong plane to pass through the second. When high voltage is applied to the electrodes in the Kerr cell, the state of the polarization of the polarized light is immediately altered, allowing the light image of the subject being photographed to pass the second plate and on through the camera lens to the film.

By controlled timing of the voltage, photographic records with an effective exposure time of one hundredth of a millionth of a second have been obtained. The camera is designed for use in studying certain rapidly changing phenomena which heretofore science has been unable to observe and record accurately.

Science News Letter, May 15, 1948

ASTRONOMY-PHYSICS

Moon Does Not Influence Cosmic Rays on Earth

➤ THE moon may shine brightly upon the earth and may even influence human actions through romantic or outmoded superstition, but it can't affect materially the cosmic rays that bombard the earth from outer space.

Dr. Manuel Sandoval Vallarta, Mexican physicist, who has been guest this winter at the Tata Institute of Fundamental Research in Bombay, India, has assayed mathematically the possible effect of the moon's magnetic field on these penetrating particles.

Even though Drs. S. Chapman and P. M. S. Blackett in British studies have been able to compute the magnetic field of the moon, Dr. Vallarta's analysis shows that it is so small that it would affect cosmic rays of only such low energy that they would not be likely to reach the earth. He tells scientists, in a report to the British journal, *Nature* (April 24), that they will have to look elsewhere for an explanation of the daily and seasonal variations in cosmic rays.

Science News Letter, May 15, 1948

ENGINEERING

First Gas Turbine Engine For Power Plant Revealed

➤ A GAS turbine engine, now under construction, will be installed in Oklahoma City to develop electricity for the Oklahoma Gas and Electric Company, and will probably be the first gas turbine used for an electrical utility in this country.

The engine is being built by General Electric, Schenectady, N. Y., and is a duplicate of a 4,800-horsepower locomotive gas turbine now undergoing tests. The installation will be a 3,500-kilowatt gas-turbine generator set. It will be ready for operation in about a year.

Natural gas will be used for fuel in this gas-turbine installation, a fuel of which this state has an ample supply. Another advantage of this type of power plant is that the gas turbine requires practically no water, and water in this region is not as plentiful as it is in some other parts of the country.

In the gas turbine, fuel is burned mixed with air under pressure in an air-cooled combustion chamber, and the resulting expanded gases are driven against hundreds of vanes on a propeller shaft. Maintenance is low because the gas turbine has only two major moving parts. Oil may be used for fuel as well as natural gas. A coal-burning gas turbine also has been developed, and will be used on locomotives. The coal used must first be very finely pulverized, and burns in the combustion chamber in a swirling mass of air.

Science News Letter, May 15, 1948

GENERAL SCIENCE

Young Scientists' Training Shouldn't Be Interrupted

➤ TRAINING of students in the natural sciences should not be interrupted by military service in future draft or military training programs, the nation's largest general organization of scientists warned.

The executive committee of the American Association for the Advancement of Science "deems it essential that laws covering the manpower needs of our military forces do not interrupt the continued training of qualified students in the natural sciences on the under-graduate and graduate level," a resolution of the group declared. Members of the committee are 11 American leaders in science.

Science News Letter, May 15, 1948

ORNITHOLOGY

Antarctic Penguin Hunting

These flightless birds are easily caught but keeping them alive poses problem. Washington has the largest group of emperor penguins assembled in any zoo.

By DR. FRANK THONE

See Front Cover

FOR portly dignity, a trifle on the pompous side, visitors to Washington should not ascend Capitol Hill. They should go out to the National Zoological Park.

There they will find not mere senators, but a conclave of emperors. Solemn emperor penguins, all in impeccable full dress, and all with an air of having just arrived at a momentous, world-changing decision which they aren't going to tell common mortals.

Sometimes they march in decorous procession, the full length of their glassed-in, specially air-conditioned enclosure, then turn around and as decorously parade back again. It is all very impressive—and it doesn't mean a thing. Except, perhaps, "When do we get our fish?"

When the fish do arrive, they are very likely to be distributed by the penguins' oldest human acquaintance, the man who journeyed to Antarctica to collect and bring to Washington the largest group of emperor penguins ever assembled in any zoo, and then nursed them through heart-breaking days of oppressive heat as his ship steamed up through the tropics. He is Malcolm Davis, who runs the birdhouse at the Washington Zoo, and is the world's Number One penguineer. Mr. Davis is shown with three emperors on this week's cover of the SCIENCE NEWS LETTER.

Five-Month Expedition

The big birds now in Washington, each more than half as high as a tall man, were collected during a five-months' expedition along the coasts of Antarctica carried out by two Navy ice-breakers, the *Edisto* and the *Burton Island*. As the two stout ships probed their way along more than half of Antarctica's icy coastline through the perpetual daylight of the South Polar summer, Mr. Davis kept himself on a fireman's schedule. At the lookout's shout of "Penguins!" he would drop whatever else he was doing, or roll out of his bunk if he was taking a nap, and prepare to land.

Tactics for capture varied. If the birds were more than a quarter-mile from the edge of the ice, an ordinary boat landing sufficed; for while an emperor penguin can make pretty good speed in his first efforts to escape, he tires in about a quarter-mile and can thus be overhauled. But if they were near the edge of the ice, or in the water, one of the expedition's helicopters was called into action. This was, incidentally, the first time helicopters were ever used in hunting penguins. The pilot would fly his whirligig aircraft close to the penguins, and the big birds, alarmed at the disturbance, would head inland. When they had been herded more than the requisite quarter-mile from the water, the pilot would make a landing on the ice and Mr. Davis would pile out and begin the pursuit.

Chasing Penguins

When a penguin tries to get away he turns into a temporary quadruped; does a "bellywopper" and propels himself over the ice or crusted snow with both feet and flippers. He can make pretty good speed this way, but can't keep it up long. Once overtaken, football tactics are in order. You dive at him and try to get a good hold on a flipper. The penguin struggles violently, and since an emperor penguin weighs 50 pounds it is likely to be quite a tussle. Fortunately, says Mr. Davis, the big birds do not offer to use their formidable beaks, merely buck and squirm and try to break away. Fortunately also there was always plenty of voluntary help from members of the crew. Most U. S. Navy men have had at least a little football experience, and penguin catching offered a chance for some rough-and-tumble fun.

After the big bird was subdued, he would be stuffed headfirst into a seabag and the mouth quickly secured. The big canvas bag used by sailors for stowing their gear is just the right size for an emperor penguin, and plenty strong enough to keep him from breaking out. Then a short haul to helicopter or boat, and presently the penguin would be aboard the *Edisto,* making acquaintance with his fellows already in the penguin pen.

In addition to the big emperors, Mr. Davis also captured a number of the little Adelie penguins, of which only four survived the discomforts of the voyage through the tropics. Catching Adelies is much easier, he states. Although they weigh only about seven pounds, as against the emperors' 50, they are as pugnacious as the big birds are pacifist. Adelies come waddling up, waggling their flippers, and in general asking in sign language, "Wanna fight?" So you just swing a long-handled crab-net—and there you have your Adelie.

They Can't Stand Heat

While capturing penguins requires far voyaging and strenuous work, it isn't too difficult. Getting the birds back alive is the really heartbreaking job. With the sole exception of the peculiarly adapted Galapagos penguin, no species of this group can stand heat. So while he started on the long northward voyage with 21 emperor penguins, Mr. Davis had to be satisfied to get eight of them to their destination alive.

At that, he fared better this time than he did on his first penguin-bringing expedition, when he sailed to Little America with the U. S. Antarctic Service Expedition of 1939-40. He started back with a contingent of birds but when his ship had made about half the long distance up the west coast of South America they all died. Mr. Davis promptly went back to Antarctica for some more penguins—and got enough of them through alive to justify his trip.

He feels rather acutely on this matter of shipping penguins through the tropics without benefit of refrigeration, for he hates to see penguins die. He is convinced that if he could get accommodations for his birds on a properly air-conditioned ship, or better yet, air-lift all the way from Antarctica to the Washington Airport, he could cut his losses practically to zero.

Mr. Davis not only brought back birds from Antarctica; he took some there. He had with him two pairs of carrier pig-

LITTLE ADELIE PENGUINS—Whole armies of these small flightless birds occupy long stretches of Antarctica's rocky coast.

eons, to test the practicability of using these birds as message bearers under frigid-zone conditions. They were the first pigeons to be flown over Antarctica.

On the trial flights the birds proved two things: that the pigeons actually could find their way back to their home roosts on shipboard, and that they could escape their winged enemies. There are no hawks in Antarctica, but a flesh-eating bird of the gull family, called the skua, takes their place. Once three of the pigeons left the ship on a flight, and were chased out of sight by five hungry skuas. After a couple of hours they returned, with the skuas nowhere in sight. They had outraced the predator birds so completely that the skuas didn't even figure as also-rans.

So much attention has been paid to penguins that one may get the impression that they are the only birds to be found in Antarctica. This is not at all the case, Mr. Davis states: in addition to the skuas already mentioned there are three species of petrel, cormorant, sheathbill, kelp gull and Antarctic tern. These are all summer residents only; having wings, they are able to fly north when winter comes. The flightless penguins have to get through the fury of the Antarctic winter as best they can.

Science News Letter, May 15, 1948

ASTRONOMY

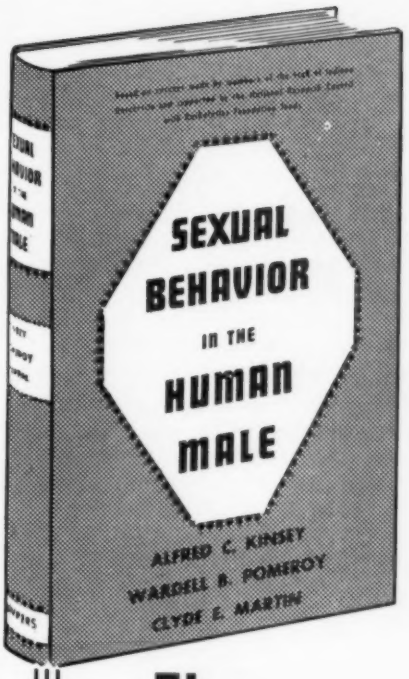
U. S. To See Nine Eclipses

➤ NINE total eclipses of the sun will be visible somewhere in the continental United States during the next hundred years.

The next total eclipse scheduled for observation in this country is that of June 30, 1954. At that time the sun will rise eclipsed for some people in Nebraska. The path of totality will then pass through South Dakota, Minnesota and Wisconsin, cross Lake Superior and continue on into Canada.

The dates of other eclipses to be visible from the United States are as follows: Oct. 2, 1959; July 20, 1963; March 7, 1970; Feb. 26, 1979; Aug. 21, 2017; April 8, 2024; Aug. 23, 2044; and Aug. 12, 2045. As the paths of totality of some of these eclipses cross within this country, in a few regions the sun may be seen totally eclipsed twice within the next century.

From 1900 to 2050, totality for 15 eclipses falls somewhere within the United States. Thus within this 150-year period, a total eclipse is seen somewhere in this country about once every ten years, calculates Dr. C. H. Clemin-



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Do You Know?

A *family* of five needs about 3,000 pounds of fruit and vegetables a year.

The *artesian* well takes its name from Artois, France, the ancient Artesium; the name actually refers to the method by which the well is bored, not to whether it runs water or not.

Some 3,200 *fire towers* and lookout stations of the U. S. Forest Service are to serve aviators in the future; they are being marked as a safety aid to the visual flyers by the Civil Aeronautics Administration.

The mixture of *chemicals* known as 3-amino-phthalhydrazide and sodium perborate is quite stable when dry but when dropped in water it gives a visible glow; wartime seaplane pilots used the mixture to estimate their height above the water.

Speedomax instrument in an airplane, recording variations in the earth's magnetic field.

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shaw of Griffith Observatory, Los Angeles. The average width of the path from which totality may be seen is about 100 miles.

The last total eclipse of the sun visible in this country was that of July 9, 1945.

Since the turn of the century, for people in a few choice regions of the United States the moon has completely hidden the sun on the following dates: May 28, 1900; June 8, 1918; Sept. 10, 1923; Jan. 24, 1925; Aug. 31, 1932.

Science News Letter, May 15, 1948

ACOUSTICS

Moth Chewing Through Fabric Is Recorded

➤ THE sound of a "moth chewing through a fabric" has been preserved on a phonograph record by Cornell University scientists.

The scientists last year produced an album of 72 bird songs. Their latest is an album of eight sides featuring the calls of 26 varieties of frogs and toads. But the moth record was made on special request—from an advertising agency with a client selling mothballs.

Getting a moth to chew at the right time and place proved to be the greatest difficulty. This was overcome by sewing the larva in a tiny cloth sack. It had to chew its way out.

And what does a moth chewing cloth sound like? "Someone eating corn flakes," reports one of the scientists, Prof. Paul Kellogg.

Science News Letter, May 15, 1948

ENGINEERING

Single-Sideband Receiver Applied to Communication

➤ A NEW communication system employing recently developed radio single-sideband techniques offers simplified apparatus and improved performance, Donald E. Norgaard, General Electric Co., Schenectady, N. Y., told the joint meeting of the International Scientific Radio Union and the Institute of Radio Engineers meeting in Washington.

The sideband is a radio wave traveling side by side with the so-called carrier, or principal wave, the steady signal which is radiated by conventional transmitters. The sideband is caused by the carrier wave. This carrier signal changes in strength with the speech or music being sent. In radio language it has amplitude modulation. This modulation sets up the additional waves which are immediately adjacent to the carrier wave. They are ordinarily so close that they cannot be distinguished from it.

The new development covers both transmission and receiving equipment, Mr. Norgaard stated. When the single-sideband receiver alone is employed on conventional transmission, distortion caused by selective fading is eliminated.

Optional choice of the sideband to be received allows reduction or elimination of interference. For this reason, the single-sideband receiver should find immediate public acceptance whenever reception over moderate or long distances is required with a minimum of interference.

Complete single-sideband operation permits exactly twice the number of transmission channels over present practice, he continued, with a system improvement in each channel. Transmitter efficiency under these circumstances is higher than that of any other system of voice communication by radio.

These factors have resulted in a communication program by the U. S. armed services and United Nations of virtually exclusively single-sideband operation.

Science News Letter, May 15, 1948

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ORNITHOLOGY

Biggest Eggs Taste Best

Small birds' eggs tend to fall in the "relatively unpalatable" group, according to tasting experiments on the flavors of all species and sizes.

➤ BIGGEST eggs taste best; littlest eggs are most likely to be bitter.

This general rule covering the flavors of birds' eggs of all species and sizes is derived from tasting experiments made under the direction of Dr. Hugh B. Cott of the University Museum of Zoology, Cambridge, England. Eggs of 81 species of domestic poultry and wild birds, ranging from hen to wren, were sampled by a panel of three judges.

These three men, Dr. J. Brooks, H. P. Hale and Dr. J. R. Hawthorne, had had wartime experience as food tasters in connection with Britain's large-scale purchases of food supplies, so they brought educated tongues to their task. All eggs were served scrambled and steam-cooked, and no species was known in advance to the judges, except the high-grade hens' eggs served as flavor standard or control. Each judge had a chance to sample all species of eggs at least twice during the test period.

By this critical but impartial method of judging, eggs of several species of gulls were rated just under hens' eggs and just over guinea-fowl eggs, but several grades better than eggs of the domestic turkey; though all were in the group pronounced "relatively palatable". A few birds with small eggs, like hedge-sparrow, bullfinch and rock-dove, managed to get into this group.

By far the largest number of small birds' eggs, however, gravitated into the "relatively unpalatable" group. Here were eggs of such birds as linnet, whitethroat, reed warbler and blackcap. At the very bottom were eggs of the common wren, with a rating only one-fifth as high as that of the best hens' eggs.

Eggs of intermediate taste, neither very good nor very bad, included such familiar species as magpie, pheasant, domestic duck, swallow, blackbird, cowbird and catbird.

Birds' diets seem to have little relation to the palatability of their eggs. Thus, eggs of fish-eaters like the gulls and terns ranked near the top, and were not noticeably "fishy" to the taste. Again the scavenger carrion-crow was rated as producer of "intermediate" eggs, actually slightly better than those of pheasant or duck, while the cleanly wren's eggs were least tasty of all.

Some effort was made to test egg-eating animals' tastes, by offering them choices between two kinds of eggs. The animals used—rats, ferrets and European hedgehogs—showed roughly the same preferences as did the human tasters, though there was some disagreement. Closest agreement came over eggs nearest the bottom of the list, which human tongues found bitter. Dr. Cott suggests that bitterness of eggs may have some survival value to birds under natural conditions, by causing possible nest-robbers to turn aside and seek food elsewhere.

Details of the test are discussed in the journal, *Nature* (Jan. 3).

Science News Letter, May 15, 1948

RESOURCES

Oil Shale Good for Fuel

➤ MOTOR fuels from oil shale should be given an early place in the production of synthetic liquid fuels. Coal and natural gas have other uses. Oil shale has none. Any fuel recovered from it is a net addition to national fuel resources, with no waste involved.

This is the opinion of R. M. Bartlett, vice president, Gulf Oil Corporation, Pittsburgh, expressed to the Fuel Oil Distributors Association of New Jersey. At present, he said, production of synthetic fuel from natural gas has the disadvantage of losing about half the heat value of the gas in the process. In the production of motor fuels from coal, about 60% of the heat value is lost.

Synthetic fuel research is urgent, he stated, to conserve American crude oil reserves and as insurance against the possibility of foreign supply being cut off by war. Present research projects will require about three years to complete. The building of commercial plants should be delayed to take advantage of the technical advances that will be made.

Mr. Bartlett urged the immediate extensive development of pipe line and tanker transportation for oil mined in the Arabian-Iran-Iraq area. He urged also the construction of refineries in Europe under the European Recovery Plan. This would help make Europe self-sufficient in satisfying its oil needs.

In view of the present shortage of steel, the Middle East offers an advantage. For each ton of steel used, from five to ten times as much oil can be produced. This is because of the comparatively shallow wells and the tremendous volume of oil per well. The average daily production of crude in the United States is about 12 barrels per well; in Venezuela, about 250 barrels; and in the Middle East, about 4,000 barrels, he asserted.

Science News Letter, May 15, 1948

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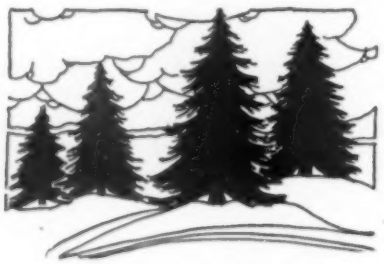

Feudal Fortifications

➤ WALLED CITIES, we are told in school, became obsolete with the passing of feudalism. They served their purpose in ancient and medieval times, first as the hard-shelled nuclei of city-states, then as strong centers of resistance to the raids of barbarian hordes and the anarchic attacks of only slightly more civilized robber barons. But with the firm establishment of modern states and the development of modern arms, the every-town-for-itself idea lost its usefulness.

This may be true in the field of human relations, but when it comes to protection against the wild forces of nature our cities still remain largely medieval. When rivers rise to flood stage in spring, we find river towns becoming increasingly concerned about the height and strength of their river walls. If a neighboring city has a higher and stronger levee there is apt to be a good deal of envious comment in newspaper editorials and radio comment. We even find mile upon mile of embankments along our larger rivers, especially in the South, to protect farm lands. This kind of fortification of whole regions has not been practiced in a military way since the Chinese in Asia and the Romans in Europe built their famous great walls to check the hordes of northern barbarians.

True flood protection of our river cities and lands, conservationists never tire of pointing out, can be achieved only by stopping the floods where they start—far up on the watersheds, where rivers are still no more than creeks. Reforestation or resodding of sloping lands, to reduce runoff and encourage the absorption of water into the soil and its long-time storage there, will do much to cut down the number of small floods and mitigate the severity of big ones.

These water-conserving measures are also soil-conserving, for they hold the soil in place and prevent it from washing down into the rivers. Once washed into the streams, such ruined soil becomes channel-choking silt and sand, raising the level of the bottom and compelling the building of downstream protective embankments to ever more towering (and costly) castle-like heights. So it is good economics, as well as good civics, to seek your flood protection as far upstream as possible.

Science News Letter, May 15, 1948

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HORTICULTURE

Flowers "By the Pound"

➤ YOU may never ask your florist for a "pound of roses" for Mother's Day or any other time, but their weight may determine the kind of flowers you get and how much you pay for them.

A new method of grading cut flowers by weight has been developed in the floriculture department at Cornell University. It promises to help the entire flower industry. Many growers are enthusiastic and anxious to put the new system into operation as soon as possible.

"Quality in cut flowers is best expressed by weight which takes care of size and stem length and size of flower display on the stem," says Prof. Kenneth Post.

"Weight cannot take into account color, crooked stems, odd or misshapen flowers, but the poor flowers are easily eliminated by the sorter."

Flowers already graded in research at Cornell include pompom chrysanthemums, carnations, roses, stocks, snapdragons, and iris. Prof. Post believes research can find grade standards for nearly all cut flowers on a weight per stem basis.

Using the standards, both retailer and wholesaler will know the exact kind of merchandise they get and growers will learn what quality the markets demand.

Consumers also will know what kind of flowers they buy instead of getting a bunch of flowers of all sizes, shapes, and quality.

At present, says Prof. Post, poor flowers are included with good ones and prices may be based on the poorest in the bunch rather than the best. Under the weight grading system, the better and poorer specimens can be grouped by themselves.

Science News Letter, May 15, 1948

Science Service Radio

➤ LISTEN in to a discussion about "An Archaeological Race Against Time" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EDST Saturday, May 22. Dr. William Strong, professor of anthropology at Columbia University, will be the guest of Watson Davis, director of Science Service. Dr. Strong will discuss the problem of the pressing need for emergency archaeological excavations in our river valleys before dams and other flood projects are constructed.

Science News Letter, May 15, 1948

• Books of the Week •

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AIRBORNE WARFARE—James M. Gavin—*Infantry Journal,* 186 p., illus., $3.00. The author foresees for future warfare a troop-carrying aircraft that would release the entire fuselage at the destination, the pilot returning with the power plant to pick up another cargo body. He also looks for high-speed chutes that will permit safe jumping at several hundred miles per hour.

THE BLOWFLIES OF NORTH AMERICA—David G. Hall—*Thomas Say Foundation,* 477 p., illus., $6.50. A systematic account of the 83 species known in North America and familiar to most of us as "bluebottles".

THE BULLDOG: An Illustrated Standard of the Breed; A Picture Study of Good Points and Faults; Containing Information on the History, Anatomy, Breeding, Feeding, Training and Management of Bulldogs—Enno Meyer—*Orange Judd Publishing Co.,* 151 p., illus., $3.00.

THE CARE AND MANAGEMENT OF LABORATORY ANIMALS: Handbook of the Universities Federation for Animal Welfare—Alastair N. Worden—*Williams and Wilkins,* 368 p., illus., $8.50.

ELECTRONIC INSTRUMENTS—Ivan A. Greenwood, Jr., J. Vance Holdam, Jr. and Duncan Macrae, Jr., Eds.—*McGraw-Hill,* 721 p., illus., $9.00. Treating electronic analogue computers, instrument servomechanisms, voltage and current regulators and pulse test equipment, all important adjuncts to many modern radar systems.

THE ENGINEERING SOCIETIES YEARBOOK; The Periodical Reference Book on Engineering Societies, Clubs, and Councils in the United States and Canada—Harry B. Coffin, Ed.—*American Society of Mechanical Engineers,* 95 p., paper, $3.00.

ESSENTIALS OF RADIO—Morris Slurzberg and William Osterheld — *McGraw-Hill,* 806 p., illus., $4.00. A textbook for students of radio and others who wish a knowledge of the subject.

FATTY ACIDS AND THEIR DERIVATIVES—A. W. Ralston—*Wiley,* 986 p., $10.00. Concerned only with those acids which contain six or more carbon atoms and their derivatives.

MANUAL ON WOOD CONSTRUCTION FOR PREFABRICATED HOUSES — Forest Products Laboratory—*Govt. Printing Office,* 330 p., illus., paper, $1.50. For all those interested in planning or in building—a wealth of information and "know-how."

THE MODERN METALLURGY OF ALLOYS—R. H. Harrington—*Wiley,* 209 p., $3.50. A reference book and text for students, instructors, and practicing metallurgists.

OUR ENEMY THE TERMITE—Thomas Elliott Snyder—*Comstock,* rev. ed., 257 p., illus., $3.50. A new edition of an important book which has been out of print for several years. Damage done by this insect is described, as well as methods of control, but the author warns against exaggerated fears.

POULTRY HANDBOOK: An Encyclopedia for Good Management of All Poultry Breeds —Rudolph Seiden, Ed.—*Van Nostrand,* 410 p., illus., $6.00. Information for poultry raisers all in alphabetical order.

PHYSIOLOGIC THERAPY IN RESPIRATORY DISEASES—Alvan L. Barach—*Lippincott,* 2d ed., 408 p., illus., $9.00. On the use of oxygen, carbon dioxide, rare gases, helium, positive pressure, alternating pressure, equalizing chest pressures and aerosols.

PSYCHOLOGICAL WARFARE—Paul M. A. Linebarger—*Infantry Journal,* 259 p., illus., $3.50. The understanding of psychological warfare and the defenses against it is an important part of winning not only the victory but the peace. Here is distilled the experience of the author as civilian expert and as Army officer in World War II.

PULSE GENERATORS—G. N. Glasoe and J. V. Lebacqz, Eds.—*McGraw-Hill,* 741 p., illus. $9.00. Report of research developing from the need for equipment capable of delivering high-power pulses for a microwave-radar system; the techniques are, however, applicable to many problems in physics and engineering.

THROW ME A BONE: What Happens When You Marry an Archaeologist — Eleanor Lothrop — *McGraw-Hill,* 234 p., illus., $3.00. The author got a lot of amusement out of the archaeological expeditions to Chile and Guatemala which constituted her honeymoon.

VIOLIN VARNISH: A Plausible Re-Creation of the Varnish Used by the Italian Violin Makers Between the Years 1550 and 1750 A.D.—Joseph Michelman—*Joseph Michelman,* 185 p., $3.75. The results of research into old manuscripts and chemical experimentation presented for the benefit of scientists, collectors, and violinists.

Science News Letter, May 15, 1948

France, until about a decade ago, furnished America with most of its *cigarette paper,* using linen rags of Europe as a source of materials; America now makes its own cigarette paper and makes it from home-grown flax.

MEDICINE

Sex Hormones May Help Heal Broken Bones in Aged

➤ SEX hormones may help the healing of broken bones in old people, it appears from a report of Dr. W. O. Thompson of Chicago to the American College of Physicians meeting in San Francisco.

Male hormone treatment of broken bones in old men is one of 14 uses of this material listed by Dr. Thompson.

Use of the hormone is based on its influence on the growth of bone and laying down of calcium in bone. Not enough observations of the hormone's effect in broken bones have been made to prove beyond doubt that it is helpful, Dr. Thompson cautioned, but several scientists have observed good results.

Similar improvement, he said, has been reported in older women with broken bones as a result of doses of female hormone, which also influences growth of bone.

Science News Letter, May 15, 1948

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New Machines and Gadgets

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INTERCHANGEABLE FRAMES for eyeglasses permit the use of frames to match milady's dress, using the same pair of lenses. These can be shifted from one frame to another by the use of notched lock-joints built into the frames and ordinarily invisible.

Science News Letter, May 15, 1948

STEEL-AND-TIN CONTAINERS for photoflash bulbs during shipment by airplanes are designed to protect the bulbs from premature ignition by radar waves transmitted by airport radar stations. In exhaustive tests, the metal of the container was found, it is claimed, to deflect the radar impulses.

Science News Letter, May 15, 1948

SAFETY VALVE tire core, which fits any standard type tire valve, automatically releases excessive air pressure, providing protection against blow-outs caused by air expansion during hot weather. The device, easily installed, can be set to accommodate any air pressure range the motorist may desire.

Science News Letter, May 15, 1948

KEY RING CHAIN and flashlight in combination takes little space in the pocket and makes the finding of the keyhole on car door or ignition easy. The flashlight, in an attractive plastic casing, is a little over three inches in length; the chain is long enough to reach the lighted keyhole.

Science News Letter, May 15, 1948

FLOOR-WAXER has a five-foot handle, that holds a gallon of liquid wax, and an 18-inch sheepskin-covered sweep, as shown in the picture. Wax flows into the sweep from the handle through a water-tap type control. The empty waxer, with its light-weight plastic handle, weighs only 3.5 pounds.

Science News Letter, May 15, 1948

SHAMPOO TRAY for home use fits around the back of the neck under the hair, and has an open end which projects over a sink. It is made of rust-proof aluminum, and has two suction cups to hold it in place, fastened either to the center or side of the basin.

Science News Letter, May 15, 1948

WOOL-FACED RUGS, priced considerably lower than woven carpets, have color and design applied by a giant six-color rotary press. The wool surface is needled, not woven, into a jute backing to make this soft-surfaced floor covering.

Science News Letter, May 15, 1948

MATTRESS COVER and hospital sheeting coated with synthetic rubber has tensile strength that makes it safe from tearing or other injury even by violent patients. It is resistant to oil, boiling water, steam and to chemical sterilization.

Science News Letter, May 15, 1948

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Question Box

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Photographs: Cover, Fremont Davis; p. 307, Antony E. Raubitschek; p. 309, Carnegie Institution Department of Johns Hopkins Medical School; p. 311, Westinghouse Electric Corp.; p. 315, Navy.